

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No. 10/706,039

REMARKS

Claims 1-17 are all the claims pending in the application. Claims 1-12 are withdrawn. Reconsideration and allowance are respectfully requested in view of the following remarks.

An objection was raised regarding Claim 15 because it refers to itself in dependency. Applicant has amended “A radiographic-image recording medium according to claim 15” to recite “A radiographic-image recording medium according to claim 13,” as suggested by the Examiner.

Rejection Under 35 U.S.C. § 103(a) - Okada in view of Fukui, Shoji, and Izumi

Claims 13 and 15 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Okada et al. (U.S. Patent Application Publication #2002/0121606; hereinafter “Okada”) in view of Fukui et al. (US Patent #6,075,250 A; “Fukui”), Shoji (US Patent #6,614,045 B2), and Izumi (US Patent Application Publication #2002/0092992 A1). Applicant respectfully traverses the Examiner’s rejection as follows.

An exemplary embodiment of the invention relates to a radiographic-image recording medium. The radiographic-image recording medium comprises a support which is transparent to the radiation for use in recording, and resistant to shock; a wavelength conversion layer which is formed under the support, and contains an organic binder and a fluorescent material; and a photoelectric conversion layer which is formed under the wavelength conversion layer, and contains a substrate and at least one photoelectric element. The substrate includes a plate of a shock-resistant material and a thin glass film formed on the plate, and the at least one photoelectric element is arranged on the thin glass film.

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The disclosures of Okada, Fukui, Shoji and Izumi, either alone or in combination, fail to teach or suggest every element of the claimed invention. Okada discloses in Figure 15 a radiographic image recording medium that includes a phosphor layer (113); a base member (111) for support of the phosphor layer; and a sensor panel (100), containing a glass substrate (101), a photoelectric conversion unit (102), a wiring unit (103), and a protective layer (104) to protect the photoelectric conversion and wiring units (Okada, paragraphs 6-8).

However, there is no teaching in Okada of, *inter alia*, “a support which is transparent to radiation for use in recording, and resistant to shock” in a radiographic image recording medium. Okada also does not teach or suggest the use of a photoelectric conversion layer containing a substrate which includes a plate of a shock-resistant material and a thin glass film formed on the plate, with at least one photoelectric element arranged on the thin glass film. Moreover, Okada does not disclose that the wavelength conversion layer contains an organic binder and a fluorescent material.

Although the Examiner maintains that Okada in view of Fukui teaches a radiographic-image recording medium comprising a support which is transparent to radiation for use in recording that is resistant to shock, these claimed elements are not taught or suggested by the cited references. As discussed above, although Okada teaches a radiographic-image recording medium comprising a support, Okada does not teach or suggest the use of “a support which is transparent to radiation for use in recording, and resistant to shock.” The examiner has relied on Fukui solely for the teaching of an alleged support that is transparent to radiation for use in

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recording and resistance to shock. However, the disclosure of Fukui does not remedy the deficiencies of Okada.

Fukui discloses in Figure 2 an improvement to the shock resistance of a phosphor layer used for radiographic image storing by stacking a protective (scratch resistant) film (23), a transparent support layer (21), a stimulable phosphor layer (22), and a protective (scratch resistance) film (24), in that order (column 3, lines 66, 67; column 4, lines 1-5). Although Fukui discloses *the use of a protective film to improve the scratch resistance of a radiographic image recording medium*, Fukui does not teach or suggest that the medium's support member itself is transparent to radiation and resistant to shock, as claimed. Instead, Fukui only adds a protective film to the overall structure, and never suggests that the medium's support member is transparent to radiation and resistant to shock.

Fukui also does not teach or suggest a photoelectric conversion layer containing a substrate which includes a plate of a shock-resistant material and a thin glass film formed on the plate, with the photoelectric element arranged on the thin glass film. Fukui's invention only relates to the storage of radiographic images in a stimulable phosphor layer. The stored image is retrieved from the stimulable phosphor layer by applying stimulating rays onto the stimulable phosphor, which would cause the stimulable phosphor to emit light, and then collecting and converting the emitted light into electrical signals. Fukui's invention does not include a substrate containing a photoelectric element to collect light and converting it to electrical signals; therefore, Fukui does not teach or suggest the substrate as claimed. Furthermore, neither Shoji nor Izumi teach or suggest such a support or photoelectric conversion layer as claimed.

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The Examiner further maintains that Okada in view of Fukui, Shoji, and Izumi, teaches a radiographic-image recording medium containing a substrate which includes a plate of a shock-resistant material and a thin glass film formed on the plate, with the photoelectric element arranged on the thin glass film. As discussed above, Okada and Fukui, either alone or in combination, do not teach or suggest a substrate which includes a plate of a shock-resistant material and a thin glass film formed on the plate, with at least one photoelectric element arranged on the thin glass film.

The Examiner has relied on Shoji solely for the alleged teaching of a thin glass film on a base plate on a photoelectric conversion layer of a radiographic-image recording medium. However, although Shoji discloses the use of a thin glass substrate, Shoji's way of providing support for a reading-side layer by using a transparent base plate (5), which is not made of glass, and having a thin glass substrate (10) as shown in Shoji's Figure 1 (column 7, lines 30-38) does not teach or suggest a thin glass film and a shock resistant material included in a substrate contained in a photoelectric conversion layer. Furthermore, there is also no teaching or suggestion in Shoji of a support or photoelectric conversion layer as claimed. Therefore, Shoji does not remedy the deficiencies of Okada and Fukui.

The Examiner has further relied on Izumi solely for the alleged teaching of a photoelectric conversion layer containing a shock-resistant substrate. As discussed above, Okada, Fukui and Shoji, does not teach or suggest, *inter alia*, a substrate which includes a plate of a shock-resistant material and a thin glass film formed on the plate, with at least one photoelectric element arranged on the thin glass film. Izumi does not remedy the deficiencies of

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Okada, Fukui and Shoji. Izumi discloses in Figure 1 a direct converting system made up of an active matrix substrate (1), a semiconductor film (2) and a bias electrode (3) (paragraph 41). Izumi's active matrix substrate is a resin substrate that is shock resistant and contains an active matrix. However, Izumi does not teach or suggest, *inter alia*, a substrate including a thin glass film formed on a plate of shock-resistant material, and at least one photoelectric element arranged on the thin glass film. Izumi's substrate is made of shock-resistant resin and contains an active matrix that performs the photoelectric conversion. The claimed invention, on the other hand, recites a substrate made of a shock resistant material and a thin glass film, with at least one photoelectric element arranged, not on the shock-resistant material, but on the thin glass film. Therefore, Okada in view of Fukui, Shoji and Izumi, does not teach or suggest the claimed photoelectric conversion layer containing a substrate which includes a plate of a shock-resistant material and a thin glass film formed on the plate, with at least one photoelectric element arranged on the thin glass film.

Moreover, as discussed above, Okada, Fukui and Shoji do not teach or suggest "a support which is transparent to radiation for use in recording, and resistant to shock," as claimed. Izumi also fails to teach or suggest the claimed support; thus, Okada in view of Fukui, Shoji and Izumi also fails to teach or suggest "a support which is transparent to radiation for use in recording and resistant to shock," as recited by claim 1.

At least by virtue of the aforementioned differences, claim 13 is distinguished over Okada in view of Fukui, Shoji, and Izumi. Claim 15 is a dependent claim including all of the elements of independent claim 13, which as established above, distinguishes over Okada in view

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of Fukui, Shoji, and Izumi. Therefore, claim 15 is patentable for at least the aforementioned reasons as well as for its additionally recited features.

Rejection Under 35 U.S.C. § 103(a) - Okada in view of Fukui, Shoji, Izumi, and Sato

Claim 14 has been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Okada in view of Fukui, Shoji, Izumi, and Sato (US Patent Application publication #2002/0148949 A1). Applicant traverses the Examiner's rejection as follows.

Regarding claim 13, as discussed above, Okada in view of Fukui, Shoji, and Izumi do not teach or suggest all the elements as recited by claim 13.

Sato does not remedy the deficiencies of Okada, Fukui, Shoji and Izumi. The Examiner has relied on Sato solely for the disclosure of support and substrate materials of approximately identical thermal expansion coefficients. However, there is no teaching or suggestion in Sato of either "a support which is transparent to radiation for use in recording, and resistant to shock" or of a photoelectric conversion layer containing a substrate which includes a plate of a shock-resistant material and a thin glass film formed on the plate, and at least one photoelectric element arranged on the thin glass film, as recited by claim 13.

At least by virtue of the aforementioned differences, the claimed invention distinguishes over Okada in view of Fukui, Shoji and Izumi, and further in view of Sato. Claim 14 is a dependent claim including all of the elements of independent claim 13, which as established above, distinguishes over Okada in view of Fukui, Shoji and Izumi, and further in view of Sato.

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Therefore, claim 14 is patentable for at least the aforementioned reasons as well as for its additionally recited features

Rejection Under 35 U.S.C. § 103(a) - Okada in view of Fukui and Shoji

Claims 16 and 17 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Okada in view of Fukui and Shoji. Applicant traverses the Examiner's rejection as follows.

An exemplary embodiment of the invention relates to a radiographic-image recording medium. The radiographic-image recording medium comprises a support which is transparent to the radiation used in recording, and resistant to shock; a wavelength conversion layer which is formed under the support, and contains an organic binder and a fluorescent material; and a photoelectric conversion layer which is formed under the wavelength conversion layer, and contains a substrate and at least one photoelectric element, where the substrate is realized by a thin glass film, and the at least one photoelectric element is arranged on the substrate.

As discussed above, there is no teaching or suggestion in Okada, Fukui and Shoji, either alone or in combination, of all the elements of the claimed invention. In particular, the cited references fail to teach or suggest, *inter alia*, "a support which is transparent to radiation for use in recording, and resistant to shock."

Claim 17 is a dependent claim including all of the elements of independent claim 16, which, as established above, distinguishes over Okada in view of Fukui. Therefore, claim 17 is patentable for at least the aforementioned reasons as well as for its additionally recited features.

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In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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